

NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE STANDARD

RESIDUE MANAGEMENT, RIDGE TILL

(Acre)
CODE 329C

DEFINITION

Managing the amount, orientation, and distribution of crop and other plant residues on the soil surface year-round, while growing crops on preformed ridges alternated with furrows protected by crop residue.

PURPOSE

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

- Reduce sheet and rill erosion.
- Reduce wind erosion.
- Maintain or increase soil organic matter content and improve soil tilth.
- Manage snow to increase plant available moisture.
- Modify cool wet site conditions.
- Provide food and escape cover for wildlife.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all cropland and other land where crops are grown.

This standard includes tillage and planting methods commonly referred to as ridge till or ridge planting. It does not include no-till planting on ridges, bedding, or listing operations which bury crop residues.

CRITERIA

General Criteria Applicable to All Purposes Named Above. Following crop harvest and any secondary residue removal, residues shall be maintained until planting with no additional disturbance except for normal weathering.

Ridge height shall be maintained throughout the harvest and winter seasons by controlling equipment or livestock traffic.

After planting, residues shall be maintained in the furrows until the ridges are rebuilt by cultivation. Ridges shall be rebuilt to their original height and shape during the last row cultivation.

Loose residues to be retained on the field shall be uniformly distributed on the soil surface. Cultivation and planting equipment designed to operate on ridges shall be used, such as cultivators equipped with ridging attachments and planters equipped with ridge planting attachments such as row cleaning devices and guidance systems.

Additional Criteria to Reduce Sheet and Rill Erosion. The amount and placement of residue needed and the orientation of ridges in relation to the contour, shall be determined using current approved erosion prediction technology. Calculations shall account for the effects of other practices in the conservation management system. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resource Conservation Service.

Planting and fertilizer placement shall disturb no more than one third of the row width. Soil and residue removed from the top of the ridge shall be moved into the furrow between the ridges.

After planting, the top of the ridge shall be maintained at least three inches higher than the furrow between the ridges.

The ridge shall be shaped to prevent erosion along the row by directing runoff to the protected furrow area.

Additional Criteria to Reduce Wind Erosion. The amount and orientation of residue needed during periods when wind erosion is expected to occur shall be determined using current approved wind erosion prediction technology. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of ridge height, spacing, direction, and of other practices in the conservation management system.

Additional Criteria to Maintain or Increase Soil Organic Matter Content and Improve Soil Tilth. The amount of residue needed to achieve the desired soil condition shall be determined using the current approved soil conditioning index procedure. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of other practices in the conservation management system.

Cultivation to rebuild ridges shall be done using tools which maintain residues in the surface layer.

Additional Criteria to Manage Snow to Increase Plant Available Moisture. Stubble shall be left standing as high as possible by the harvesting operation but not less than six inches in any case. Stubble shall be maintained standing over winter to trap and retain snow. In cases

where the six-inch stubble height cannot be achieved, ridges shall be oriented not to exceed 45 degrees from perpendicular to the prevailing wind direction during periods of expected snow cover.

Additional Criteria to Modify Cool Wet Site Conditions. Ridge height prior to planting shall not be less than six inches. After planting the top of the ridge shall be maintained at least three inches higher than the furrow between the ridges.

Additional Criteria to Provide Food and Escape Cover for Wildlife. The amount of residue and height of stubble needed to provide cover during winter months shall be determined using an approved habitat evaluation procedure. Residues shall not be removed unless it is determined by the habitat evaluation procedure that removal will not adversely affect habitat values. Stubble shall be maintained standing over winter.

CONSIDERATIONS

Burning of plant residue or excess removal of residue by such means as baling or grazing often produces negative impacts on resources. These activities should not be performed without full evaluation of impacts on soil, water, animals, plants, and air resources.

Ridge till may be practiced continuously throughout some crop sequences, or may be managed as part of a residue management system which includes other tillage and planting methods such as mulch till or no till. In mixed systems, ridges must be periodically re-established. Selection of acceptable tillage methods for specific site conditions may be aided by an approved Soil Tillage Suitability Rating.

Production of adequate amounts of crop residues necessary for the proper functioning of this practice can be enhanced by selection of high residue producing crops and crop varieties in the

rotation, use of cover crops, and adjustment of plant populations and/or row spacings.

By providing a choice of weed control methods, this practice can reduce herbicide requirements when used in a conservation management system.

Where improvement of soil tilth is a concern, continuous ridge planting will allow organic material to accumulate in the surface horizon. Reconstruction of ridges in the same row area year after year will maximize organic matter buildup and biological activity in the row.

Soil compaction may be reduced by controlled traffic, where wheel traffic from all operations is limited to the area between designated rows or traffic areas.

Where ridges direct runoff to areas of concentrated flow, these areas can be protected by grassed waterways, water and sediment control basins, underground outlets, or other suitable practices.

The value of residues for wildlife habitat can be enhanced by leaving rows of unharvested crop standing at intervals across the field.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operation and Maintenance described in this standard. Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

Performance Criteria.

This practice will be considered applied when the crop residue levels have been successfully established according to the

tillage system. All systems must provide at least 30 percent residue cover after planting. The line transect method will be used to determine percent of ground cover present.

This practice will be carried out consistently with Iowa State University Extension Service Weed Control Guide for the current year (PM-601), pesticide label instructions, and the laws and regulations of the State of Iowa.

Types of Conservation Tillage Systems and Variations Which Are Acceptable.

Ridge Till.

Seedbed preparation and planting are completed in one operation on ridges 4-7 inches in height. Crop residue may be left undisturbed, chopped, or shredded. Planting is completed by scalping the top of the ridge with a sweep or disk. The planting ridge is higher than the between row area. Less than one third of the field surface area is disturbed. A band application of pre-emergence herbicides along with mechanical cultivation normally controls most weed species. Ridges are reconstructed during the last cultivation of the season.

OPERATION AND MAINTENANCE

No operation and maintenance requirements have been identified for this practice.

REFERENCES

- Field Office Technical Guide, Section I-C-1, Erosion Protection
- Nutrient Management Standard 590
- Pest Management Standard 595
- Iowa State University Extension Service Weed Control Guide for the current year (PM-601)